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The knowledge level and attitude of the parents about COVID-19 vaccination in children: a single-center survey study

Ebeveynlerin çocuklarda COVID-19 aşısı konusundaki bilgi düzeyi ve tutumu: tek merkezli bir anket çalışması

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ABSTRACT

Aim: The primary method of prevention for children involves vaccination. The generally accepted approach in the world is the vaccination of eligible children for COVID-19 (Coronavirus Disease 2019). In the field of COVID-19 vaccines, hesitation and vaccine denial are anticipated concurrently with the rise in the incidence of vaccine instability and rejection around the world. The aim of this study is to find out what parents think about the COVID-19 vaccination program for children and what factors may cause anti-vaccination.

Material and Method: 208 parents with children aged 0-18 who applied to the University of Health and Sciences, Ankara Keçiören Training and Research Hospital's pediatrics clinics between April-June 2021 were included in the study. A questionnaire consisting of 26 questions developed by public health experts for COVID-19, the COVID-19 Phobia Scale (C19P-S), and the Short Form of COVID-19 Anxiety Scale were administered to the participants.

Results: 58.2% of participants believed that vaccines could only partially protect against the virus, while 19.2% disagreed and 22.6% were unsure of their position on this. While 67.3% of individuals said they would be willing to receive the COVID-19 vaccine, 36.1% said they would be willing to immunize their children ($p< 0.001$). Participants who refused to receive their own vaccinations did not consider vaccinating their children ($p<0.001$). With a rate of 76.5%, parents cited the possibility of vaccine side effects as their main objection to immunizing their children. Parents who have never been vaccinated or under-vaccinated their children according to the national vaccination program, did not intend to vaccinate their children with the COVID-19 vaccine at a higher rate. Parents who did not intend to vaccinate their children with the COVID-19 vaccine had significantly lower overall scores on the COVID-19 Phobia Scale, psychological sub-dimension, somatic sub-dimension, and social sub-dimension than parents who did ($p<0.05$).

Conclusion: The majority of parents were hesitant to vaccinate their children. The vaccine side effects were the main objection to immunizing children. Therefore understanding the attitudes and perspectives of parents toward COVID-19 vaccines may shed light on the pediatric COVID-19 vaccination programs that will be implemented in the future.

Keywords: COVID-19, vaccination, children, parents, survey

ÖZ

Amaç: Çocuklar için birincil korunma yöntemi aşılamadır. Dünyada genel kabul görmüş yaklaşım uygun görülen çocukların Koronavirüs Hastalığı 2019 (COVID-19) için aşılanması yönündedir. Tüm dünyadaki aşı kararsızlığı ve reddi insidansındaki artışla paralel olarak COVID-19 aşıları için de tereddüt ve aşı reddi beklenmektedir. Bu çalışmanın amacı, ebeveynlerin çocuklara yönelik COVID-19 aşı programı hakkındaki düşüncelerini ve aşı karşıtlığına hangi faktörlerin neden olabileceğini ortaya çıkarmaktır.

Gereç ve Yöntem: Sağlık Bilimleri Üniversitesi, Ankara Keçiören Eğitim ve Araştırma Hastanesi çocuk hastalıkları kliniklerine Nisan-Haziran 2021 tarihleri arasında başvuran, 0-18 yaş arası çocuğu olan 208 ebeveyn araştırmaya dahil edildi. Katılımcılara (COVID-19) için halk sağlığı uzmanları tarafından geliştirilen 26 sorudan oluşan anket, COVID-19 Fobi Ölçeği (C19P-S) ve COVID-19 Kısa Form Anksiyete Ölçeği uygulandı.

Bulgular: Katılımcıların %58,2'si aşıların virüse karşı yalnızca kısmen koruyabileceğine inanırken, %19,2'si aynı fikirde değildi ve %22,6'sı bu konudaki tutumlarından emin değildi. Bireylerin %67,3'ü COVID-19 aşısını yaptırmaya istekli olacağını belirtirken, %36,1'sı çocuklarını aşılamaya istekli olacağını belirtti ($p<0,001$). Kendi aşılarını yaptırmayı reddeden katılımcılar çocuklarına aşı yaptırmayı düşünmüyordular ($p<0,001$). Ebeveynler, %76,5' lik bir oranla, çocuklarına aşı yaptırma konusundaki temel itirazları olarak aşı yan etkileri olasılığını belirttiler. Ulusal aşı programına göre çocuklarına hiç aşı yaptırmamış veya eksik aşı yaptırmamış olan ebeveynler, çocuklarına daha yüksek oranda COVID-19 aşısı yaptırmayı düşünmemişlerdi. Çocuklarına COVID-19 aşısı yaptırmayı düşünmeyen anne babaların COVID-19 Fobi Ölçeği, psikolojik alt boyut, somatik alt boyut ve sosyal alt boyut toplam puanları, yaptıran ebeveynlere göre anlamlı olarak daha düşüktü ($p<0.05$).

Sonuç: Ebeveynlerin çoğunluğu çocuklarına aşı yaptırmakta tereddüt etmektedir ve bunun en sık sebebi aşının yan etkileri olabileceği düşüncesidir. Bu nedenle ebeveynlerin COVID-19 aşılarına yönelik tutum ve bakış açılarının anlaşılması, gelecekte uygulanacak pediatrik COVID-19 aşılama programlarına ışık tutabilir.

Anahtar Kelimeler: COVID-19, aşılama, çocuklar, ebeveynler, anket

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INTRODUCTION

In children, Coronavirus Disease 2019 (COVID-19) typically results in a mild recovery; serious infection is uncommon. Approximately 1%–8% of confirmed COVID-19 patients are children, according to data from the World Health Organization (WHO). Hospitalization rates range from 5.7%–20%, with a rate of 0.58% 2% in pediatric intensive care units (1,2). However, some fatal conditions can appear in some kid's weeks after infection (3).

Numerous medications have been used against the disease since the outbreak's inception (3). Since there is no treatment that has been categorically proven effective for COVID-19, vaccine development studies are crucial for preventing morbidity and mortality from the disease. Inactivated virus, attenuated live virus, recombinant protein-based vaccines, DNA, RNA, and viral vector-based vaccines have all been developed against COVID-19 (4,5).

The primary method of prevention for children involves vaccination. The generally accepted approach in the world; vaccination of eligible children for COVID-19 (6). For children between the ages of 5 and 15 years, the United States has approved BNTb162b (Pfizer COVID-19 vaccine) (7). Children over the age of 12 in Turkey are immunized, in accordance with Centers for Disease Control and Prevention (CDC) recommendations. Since kids can't make informed decisions for themselves, parental consent is necessary.

It has been identified by World Health Organization (WHO) as one of the 10 major global health issues of 2019, in part because of the rise in vaccine hesitancy and the decline in vaccination rates. If the incidence of a disease that is preventable by vaccination declines, vaccination rates may also decline as disease-related anxiety declines (6). Thanks to blogs, websites, and articles describing the dangers of vaccines in the internet environment where there is no truthfulness about vaccines, parents who believe that vaccine-related side effects and the substances in vaccines may harm the body in the long term have increased reservations about vaccination (6-9). It has been observed in our country that the rate of vaccine rejection has risen over time. The number of parents who refused to vaccinate their children grew from 183 in 2011 to 23.000 in 2018. Measles was diagnosed in 85 children across the Turkey in 2017, with 44 cases reported in the first three months of 2018. As a result, the incidence of measles increased tenfold in 2018, rising to 0.10/100.000 from 0.01/100.000 in 2016. If the number of vaccine refusal cases reaches 50.000, the possibility of an epidemic increases significantly (10, 11).

A serious threat to the public health is posed by the rise in the proportion of parents who refuse to vaccinate their kids. Refusing vaccination increases the risk of getting sick, and interruptions in vaccination programs give the infectious disease agent a chance to spread and start epidemics. The medical and economic effects of these epidemics on nations are unavoidable (12). In the field of COVID-19 vaccines, hesitation and vaccine rejection are anticipated concurrently with the rise in the incidence of vaccine instability and rejection around the world. Since the disease's discovery, there have almost always been conspiracy theories about COVID-19, and it is thought that these claims may have a negative effect on people's perceptions of these vaccines (13).

It is well known that COVID-19 vaccine hesitancy rates differ from country to country. This vaccine hesitancy may be brought on by a number of things, such as existing uncertainty, mistrust of medical professionals, financial worries, and a lack of awareness (14). Hesitancy rates have gradually decreased as a result of the introduction and use of COVID-19 vaccines. Right now, it's critical to understand how people feel about COVID-19 vaccines in order to predict its causes, combat the pandemic, and pinpoint potential contributing factors. It will be advantageous to maintain public confidence in COVID-19 vaccines if development processes, mechanisms of action, contents, results, and efficacy of studies, as well as potential risks and side effects of vaccines, are openly shared with the public (15).

Not only do infectious diseases make people afraid of getting sick or dying, but they also make people depressed and anxious (16). In addition to the fear of losing their health or their relatives, this process can also cause psychological mediators. Epidemic-related issues include social isolation, quarantine, and social isolation (17). Corona phobia is a brand-new phobia that has emerged as a result of the detrimental economic, social, and psychological effects of the COVID-19 pandemic period. The fear of losing loved ones, self-health anxiety, and increased social media use are thought to be related to corona phobia (18).

In this context, the goal of our research is to find out what parents think about the COVID-19 vaccination program for children, where they get their information, how many parents are anti-vaccine, and what factors may cause anti-vaccination. The study's findings are expected to be useful in combating the COVID-19 pandemic and may shed light on the COVID-19 vaccination program that will be implemented in the future.

MATERIAL AND METHOD

All procedures were carried out in accordance with the ethical rules and the principles of the Declaration of Helsinki. The study was carried out with the permission of University of Health and Sciences Ankara Keçiören

Training and Research Hospital Clinical Research Ethics Committee (Date: 23.03.2021, Decision No: 2012-KAEK-15/2281). With the ethics committee approval, the data were scanned retrospectively using the Hospital Information Management System.

This study included 204 parents who came to the University of Health and Sciences Ankara Keçiören Training and Research Hospital's pediatric clinic for any reason between 15.04.2021 and 15.06.2021, agreed to participate in the study, and had the cognitive ability to answer the questions. The research was conducted both prospectively and cross-sectional. In line with the number of patients expected to apply during the research period, it was calculated that at least 170 participants should be included in the study, with the assumption percentage frequency of the outcome factor in the population 14.5±5% and the confidence level of 95%. It was planned to include at least 204 people in the study based on the assumption that 20% of the cases could be excluded from the study due to missing data or deciding to drop out of the study. During this time, the questionnaire was distributed to 311 parents via face-to-face interviews, with verbal and written consent obtained. 103 parents were excluded from the evaluation for a variety of reasons, including incomplete questionnaire completion and contradictory responses. As a result, the study included 208 parents.

Scales and Questionnaires

Questionnaire form: In the study, the socio-demographic characteristics of the parents (age, gender, income level, education level, and occupation), vaccination information resources, compliance with the ministry of health's national vaccination program, attitude toward the COVID-19 vaccine, COVID-19 vaccine according to the age of the children, were prepared by a public health expert. A questionnaire with 26 questions was used to assess individuals' attitudes, chronic disease in themselves and their family members, and previous COVID-19 history. In addition to this questionnaire, individuals' corona phobia and coronavirus anxiety were assessed using scales developed in this field.

COVID-19 phobia scale (C19P-S): C19P-S is a 5-point likert-type self-assessment scale comprised of 20 items developed by Arpacı et al. (19) to assess the corona virus phobia. High scores indicate a high level of height in both sub-dimensions as well as general corona phobia.

Short form of the coronavirus anxiety scale: The Short Form of the Coronavirus Anxiety Scale, the validity and reliability of which were investigated by Biçer et al. (20), was used to assess coronavirus anxiety. Each item on the scale is worth 0-4 points. A score of 9 and above indicates a high level of anxiety.

Statistical Analysis

For statistical analysis, IBM SPSS Statistics software for Windows (Version 25.0, Armonk, NY: IBM Corp.) was used. The variables' conformity to the normal distribution was assessed using the Kolmogorov-Smirnov test, histograms, and probability graphs. For continuous variables, descriptive statistics were presented as mean (standard deviation) or median (25-75th percentile), and numbers (percent) for nominal and ordinal variables. The Mann-Whitney U test was used to determine the difference in continuous variables between groups. The chi-square test (Fisher's exact test when necessary) was used to compare differences in nominal and ordinal variables between groups. If the difference between more than two variables was found to be significant, the Bonferroni correction was used as a post hoc test.

RESULTS

The study included 208 participants; 78.4% of whom were mothers and 21.6% of whom were fathers. The mean age of the mothers was 35.2±7.5 years, and the mean age of the fathers was 38.5±8.4 years. The mean age of mothers and fathers who did not plan to have their children vaccinated was found to be lower than that of those who did ($p<0.05$). The mother's educational level was also related to her vaccination attitude ($p=0.005$). Mothers with a doctorate were more likely to have their children immunized (($p<0.05$). There was no significant relationship between the other socio-demographic characteristics and the participants' attitudes toward getting their children vaccinated ($p>0.05$) (**Table 1**).

People with whom 63.7% of the participants shared the same house had chronic diseases. Participants who lived in the same house as people with chronic diseases were found to be more likely to consider getting the COVID-19 vaccine ($p=0.021$) (**Table 1**).

Participants who refused to be vaccinated against COVID-19 also refused to vaccinate their children ($p<0.001$). Seventy-four participants had one reason not to vaccinate their children against COVID-19, 34 had two reasons, 14 had three, eight had four, and one had five. The most common reason for refusing to be vaccinated was that 76.5% believed there would be side effects, 25.7% believed COVID-19 was milder in children, 22.1% believed the vaccine would not be protective, and 14.4% believed the vaccines were from a foreign country. The number of children under the age of 18 was higher among those who did not intend to have their children vaccinated ($p=0.020$). It was discovered that the state of mind about having a child vaccinated was unrelated to the total number of children or the children's mean age ($p>0.05$). Participants who believed that the developed

COVID-19 vaccines could not defeat the virus did not want the COVID-19 vaccine to be administered to their children at a higher rate (p<0.001). Participants who believed that COVID-19 vaccines would cause serious side effects that would harm human health did not consider vaccinating their children at a higher rate (p<0.001). Participants who believed that the COVID-19 epidemic would resolve on its own, even without the vaccine, did not want their children to be vaccinated at a higher rate (p=0.002). Parents who adhered to the National Vaccination Schedule on a regular basis desired their child to be vaccinated against COVID-19 at a higher rate (p=0.004) (**Table 1**).

Table 1. Comparison of socio-demographic and vaccination attitudes of participants

	Participants do not intend to vaccinate their children (n=133)	Participants intend to vaccinate their children (n=75)	p
Role in the family (%)			0.534
Mother	108 (65.0)	57 (35.0)	
Father	27 (60.0)	18 (40.0)	
Age (years) (median (25p-75p))			
Mother	34 (30.0-38.0)	37 (30.0-42.0)	0.013**
Father	38 (31.0-41.5)	40 (32.0-45.3)	0.023**
Marital status (%)			0.734
Married	124 (64.6)	68 (35.4)	
Divorced	7 (53.8)	6 (46.2)	
Widow	2 (66.7)	1 (33.3)	
Place of live (%)			0.704
Ankara	129 (64.2)	72 (35.8)	
Others	4 (57.1)	3 (42.9)	
Mother' job (%)			0.646
White color	41 (60.3)	27 (39.7)	
Housewife	78 (65.5)	41 (34.5)	
Worker	12 (63.2)	7 (36.8)	
Jobless	2 (100.0)	0 (0)	
Father' job (%)			0.846
White color	50 (64.1)	29 (35.9)	
Worker	71 (63.4)	41 (36.6)	
Jobless	12 (70.6)	5 (29.4)	
Mother' education (%)			0.005*
Illiterate	3 (60.0)	2 (40.0)	
Literate	3 (33.3)	6 (66.7)	
Primary school	44 (68.8)	20 (31.2)	
High school	33 (64.7)	18 (35.3)	
University (associate degree)	8 (72.7)	3 (27.3)	
University (undergraduate)	36 (73.5)	13 (26.5)	
Master's degree	6 (50.0)	6 (50.0)	
PhD	0 (0.0)	7 (100.0)	
Father' education (%)			0.176
Literate	4 (57.1)	3 (42.9)	
Primary school	29 (67.4)	14 (32.6)	
High school	43 (68.3)	20 (31.7)	
University (associate degree)	18 (78.3)	5 (21.7)	
University (undergraduate)	25 (56.8)	19 (43.2)	
Master's degree	6 (42.9)	8 (57.1)	
PhD	2 (33.3)	4 (66.7)	
Income situation (%)			0.353
Low	42 (70.0)	18 (30.0)	
Moderate	56 (59.9)	39 (41.1)	
High	35 (66.0)	18 (34.0)	
Number of children in the family (%)			0.143
1	45 (64.3)	25 (35.7)	
2	55 (72.4)	21 (27.6)	
3	25 (53.2)	22 (46.8)	
≥4	8 (53.3)	7 (46.7)	
Number of people living in the house (%)			0.101
1	0 (0)	1 (100.0)	
2	3 (75.0)	1 (25.0)	
3	33 (55.9)	26 (44.1)	
4	56 (73.7)	20 (26.3)	
5	27 (55.1)	22 (44.9)	
≥ 6	14 (73.7)	5 (26.3)	
Presence of chronic diseases in people living in the same house (%)	36 (52.9)	32 (47.1)	0.021*
Presence of unemployment in the family during the pandemic (%)	51 (61.4)	32 (38.6)	0.541
Number of children (median (25p-75p))	2 (1-2.5)	2 (1-3)	0.224
Number of children under the age of 18 (median (25p-75p))	2 (1-3)	2 (1-2)	0.020**
The mean age of children under the age of 18 years (median (25p-75p))	6.7 (3-10.8)	8.5 (3-12.5)	0.212
Wish to be immunized against COVID-19 (%)	66 (47.1)	74 (52.9)	<0.001*
Believe that the COVID-19 vaccine will cause serious side effects (%)	52 (86.7)	8 (13.3)	<0.001*
Reasons for refusing the COVID -19 vaccine (%)			
Considered the side effects	76.5		
The possibility of not being protective	22.1		
Vaccine originating from a foreign country	22.9		
The child has had COVID-19	15.3		
Mild course of COVID-19 in children	26		
Others	5.3		
Views on the effect of COVID-19 vaccines on the virus (%)			
Partially defeat the virus	63 (52.1)	58 (47.9)	<0.001*
No idea	32 (68.1)	15 (31.9)	
Participation in the national vaccination program (%)			
Have never been vaccinated or under-vaccinated	21 (91.3)	2 (8.7)	0.004*
Have regular vaccinations	112 (63.9)	75 (36.1)	
Sources of vaccine information (%)			
Form a tight circle	16 (80.0)	4 (20.0)	0.116
Television/radio/newspapers	7 (41.2)	10 (58.8)	0.041*
Internet	24 (64.9)	13 (35.1)	0.897
Nurse/midwife	92 (70.8)	38 (29.2)	0.008*
Doctor	59 (56.2)	46 (43.8)	0.019*
Cases of COVID-19 in the family (%)			
A family member died as a result of COVID-19	18 (47.4)	20 (52.6)	0.019*
A family member was infected with COVID-19	47 (60.3)	31 (39.7)	0.391
COVID-19 Phobia Scale (median (25p-75p))			
Psychological sub-dimension	15 (11-20)	17 (13-23)	0.013**
Somatic sub-dimension	6 (5-10)	8 (6-13)	0.021**
Social sub-dimension	12 (9-15)	13 (10.8-17.3)	0.009**
Economic sub-dimension	6 (4-9)	7 (4-10)	0.120
Total score	42.5 (31.3-52.8)	49 (36-59.5)	0.005**
COVID-19 Anxiety Scale (median (25p-75p))	0 (0-2)	0 (0-3)	0.207

*p<0.05, chi-square test, ** p<0.05, Mann-Whitney U test

Participants who received vaccine information from TV/radio/newspaper were significantly more likely to have their children vaccinated (p=0.041). Nurses/midwives and doctors were the most common sources of vaccine information, accounting for 62.5% and 50.5%, respectively. Participants who did not receive vaccine information from doctors were found to be less likely to consider having their children vaccinated (p=0.019) (**Table 1**).

While 18.3% of the participants had a family member who had COVID-19 disease, 37.5% had a family member who had COVID-19 disease. Participants who did not have a history of death due to COVID-19 in their immediate vicinity did not want their children to be vaccinated against COVID-19 at a higher rate (p=0.019). The presence of a person with COVID-19 in the family was found to be unrelated to parents' attitudes toward administering the COVID-19 vaccine to their child (p>0.05) (**Table 1**).

The total COVID-19 Phobia Scale as well as the psychological, somatic, and social sub-dimension scores of those who did not want their child to be vaccinated against COVID-19 were significantly lower than those who did (p<0.05). The economic sub-dimension scores of the COVID-19 Phobia Scale and the Coronavirus Anxiety Scale did not differ significantly between the two groups (p>0.05) (**Table 1**).

Individuals who believed their child would not be vaccinated against COVID-19 had significantly lower scores on the COVID -19 Phobia Scale in all sub-dimensions and total scores (p<0.005). Only the COVID -19 Phobia Scale Psychological sub-dimension score of participants who refused to be vaccinated against COVID-19 due to vaccine originating from a foreign country was significantly lower (p=0.010). Those who stated other reasons for not getting vaccinated scored significantly lower on the COVID-19 Phobia Scale somatic, social, economic, and total (p<0.05) (**Table 2**). The presence of more than one reason for not wanting to receive the COVID-19 vaccine was found to have a significant correlation with a low COVID-19 Phobia Scale Psychological sub-dimension, Somatic sub-dimension, Social sub-dimension, Economic sub-dimension, and Total score (p<0.005) (**Table 3**).

There was a significant difference in the COVID-19 Phobia Scale Psychological sub-dimension, Somatic lower neck, Social sub-dimension, and total score scores of participants who held different beliefs about the potential serious side effects of COVID-19 vaccines (p<0.05). According to the post hoc analyses, the scores of participants who expected to have side effects were significantly lower than those who expected to have no side effects (p<0.05) (**Table 4**).

Table2. Comparison of coronavirus phobia and anxiety levels among parents who do not want to vaccinate their children against COVID-19 (n=131¶)

	Considered the side effects			The possibility of not being protective			Vaccine originating from a foreign country		
	Yes (n=101)	No (n=30)	p	Yes (n=29)	No (n=102)	p	Yes (n=30)	No (n=101)	p
COVID-19 phobia scale									
*Psychological sub-dimension	15 (11-20)	15.5 (10.8-21)	0.989	11 (7-16)	16 (13-20.3)	<0.001*	13 (8-18)	16 (12-21)	0.010*
*Somatic sub-dimension	6 (5-10)	7 (6-10)	0.248	5 (5-9)	7 (5-10)	0.022*	6 (5-9.3)	7 (5-10)	0.707
*Social sub-dimension	12 (9-15.8)	12 (9-15)	0.890	10 (5-12.5)	13 (10-16)	0.003*	10 (15-7)	12 (9-15.5)	0.131
*Economic sub-dimension	6 (4-9)	7 (4.8-8.3)	0.361	4 (4-7)	6 (4-9)	0.016*	5 (4-8.3)	6 (4-9)	0.394
*Total score	41.5 (31-53)	44 (34.8-51.3)	0.834	31 (21-45.5)	44 (36-53.5)	0.001*	39 (26-50)	43 (34.5-53.5)	0.092
COVID-19 anxiety scale	0 (0-2.5)	0 (0-1)	0.594	0 (0-4.5)	0 (0-2)	0.321	0 (0-3)	0 (0-2)	0.977
	The child has had COVID-19			Mild course of COVID-19 in children			Others		
	Yes (n=20)	No (n=111)	p	Yes (n=34)	No (n=97)	p	Yes (n=7)	No (n=124)	p
COVID-19 phobia scale									
*Psychological sub-dimension	12 (10-18)	15 (12-21)	0.120	13 (9.8-18)	16 (12-21)	0.050	7 (6-20)	15 (12-20)	0.067
*Somatic sub-dimension	6 (5.3-9)	7 (5-10)	0.883	6 (5-9)	7 (5-10)	0.302	5 (5-5)	7 (5-10)	0.021*
*Social sub-dimension	10.5 (8-15.8)	12 (9-12)	0.554	10.5 (8-15)	13 (9-15.8)	0.188	5 (5-14)	12 (9-16)	0.049*
*Economic sub-dimension	7 (5-8)	6 (4-9)	0.636	5 (4-8)	6 (4-9)	0.208	4 (4-4)	6 (4-9)	0.030*
*Total score	39 (28.3-51)	43 (32.8-53)	0.399	41 (28-46)	43.5 (33.3-53.8)	0.079	21 (20-41)	43 (33-53)	0.024*
COVID-19 anxiety scale	0 (0-4)	0 (0-2)	0.767	0 (0-1.3)	0 (0-2.5)	0.512	0 (0-09	0 (0-2)	0.288

*p<0.05; Mann-Whitney U test ¶2 people did not report why.

Table3. Correlations between the number of reasons for not wanting their child to be vaccinated against COVID-19 and the levels of coronavirus phobia and anxiety

		Number of reasons for not wanting their child to be vaccinated against COVID-19	COVID-19 phobia scale psychological sub-dimension	COVID-19 phobia scale somatic sub-dimension	COVID-19 phobia scale social sub-dimension	COVID-19 phobia scale economic sub-dimension	COVID-19 phobia scale	COVID-19 anxiety scale
Number of reasons for not wanting their child to be vaccinated against COVID-19	rho	1						
	p	-						
COVID-19 phobia scale psychological sub-dimension	rho	-0.357	1					
	p	<0.001*	-					
COVID-19 phobia scale somatic sub-dimension	rho	-0.254	0.546	1				
	p	0.003*	<0.001*	-				
COVID-19 phobia scale social sub-dimension	rho	-0.25	0.784	0.553	1			
	p	0.004*	<0.001*	<0.001*	-			
COVID-19 phobia scale economic sub-dimension	rho	-0.253	0.456	0.708	0.404	1		
	p	0.004*	<0.001*	<0.001*	<0.001*	-		
COVID-19 phobia scale total score	rho	-0.33	0.892	0.793	0.869	0.695	1	
	p	<0.001*	<0.001*	<0.001*	<0.001*	<0.001*	-	
COVID-19 anxiety scale	rho	0.017	0.474	0.506	0.484	0.382	0.561	1
	P	0.846	<0.001*	<0.001*	<0.001*	<0.001*	<0.001*	-

*p<0,05; Spearman correlation analysis

Table4. Relationship between thoughts about possible serious side effects of COVID-19 vaccines and coronavirus phobia and anxiety (n=208)

	Considered the side effects (n=60)	Undecided (n=107)	Not considered the side effects (n=41)	p¶	Post hoc analysis§		
					pa	pb	pc
COVID-19 Phobia Scale							
Psychological sub-dimension	14 (10-18)	16 (13-21)	20 (12.5-23.5)	0.003*	0.056	0.003*	0.369
Somatic subdimension	6 (5-9)	7 (5-10.3)	10 (5.5-12)	0.034*	0.135	0.043*	>0.999
Social sub-dimension	11 (9-16)	12 (10-16)	14.5 (10.5-17.8)	0.055	-	-	-
Economic sub-dimension	5 (4-8.8)	6 (4-9)	7 (5-10)	0.038*	0.141	0.049*	>0.999
Total score	40 (29-49)	45 (36-55)	53.5 (35-62.75)	0.008*	0.118	0.006*	0.337
COVID-19 Anxiety Scale	0 (0-2.8)	0 (0-2)	0 (0-3)	0.659	-	-	-

*p<0.05, ¶ Kruskal-Wallis test, §Mann-Whitney U test (Bonferroni correction applied). a Considered side effects -undecided, b Considered side effects –Not considered side effects, c Undecided –Not considered side effects. Data are presented as median (25th -75th percentile).

The mother's educational status was related to her refusal to have her child vaccinated against COVID-19 (p=0.043). High school graduate mothers predicted a higher rate of side effects (p<0.05). The other reasons for refusing COVID-19 vaccine were unrelated to the mother's educational level (p>0.05).

DISCUSSION

In this study, parents' knowledge and attitudes toward COVID-19 vaccines were examined in order to provide preliminary information about the future COVID-19 vaccination plan for children. Even if various measures slow the current pandemic's spread, it does not appear possible to reduce and end its severity unless sufficient herd immunity is provided. To achieve herd immunity, 55%-82% of the population must be vaccinated (21).

Vaccinating children is important for ensuring herd immunity as well as protecting against serious pediatric COVID-19 cases and complications such as MIS-C (3, 22).

In our study, we discovered that the ages of those who do not consider vaccinating their children are significantly lower than those who do. It was discovered that the mother's education level was related to her vaccination attitude, with mothers with a doctorate being more likely to consider having their children vaccinated. In a study from Turkey (2021 February), similar to ours, the desire to allow their children to be vaccinated against COVID-19 was found to be higher among parents aged 40 and over than among those aged 18-29, and the desire to vaccinate children increased as education level increased (23).

In contrast, two studies conducted in France (April 2020) and Australia (November 2020) found that parents' education level had no effect on their desire to have their children vaccinated (24, 25).The differences between the studies are thought to be due to sociocultural differences between countries, as well as the fact that these studies were conducted at different times during the pandemic.

In our study, it was discovered that living in the same house with someone who a chronic disease has resulted in a higher rate of parents considering having their child vaccinated. This moderate viewpoint may be due to the fact that those with chronic diseases are familiar with the health system and have previously received vaccinations such as pneumococcal and influenza. In another study, parents of children with chronic diseases were found to be less accepting of the COVID-19 vaccine for their children (21). The reason for this disparity could be that we did not question the presence of chronic disease in the form of parent or child in our study or parents' concerns about live vaccines for their immune-compromised children (26).

It was discovered in our study that those who did not want to be vaccinated did not want their children to be vaccinated at a higher rate. Similar to previous studies conducted in Turkey, 67.3% of participants were willing to vaccinate themselves against COVID-19, while 36.1% were unwilling to have their children (23, 26). Participants were more reluctant to have their children vaccinated rather than themselves. In contrast to our study, rates in England were 89%, New Zealand was 80%, China was 73%, the United States was 65%, and New York was 61.9% (24, 28, 29, and 30). This could be due to the fact that vaccine willingness varies across countries, depending on the availability of different types of COVID-19 vaccines, the time and speed of vaccination, and other factors.

Similar to other studies, the most common reasons given by parents in our study for not wanting the COVID-19 vaccine administered to their children were: the vaccine may have a side effect, COVID-19 is milder in children, and the vaccine will not be protective (23, 28, 31).

It was discovered that the mother's fear of side effects increased as her education level decreased. Because approximately 60% of those who participated in our study as "mothers" are housewives, they spend less time outdoors than working mothers, are less afraid of contracting the virus, and are more exposed to mass media (such as television, social media). The fact that they were more exposed to speculations about side effects may have helped.

Similar to studies conducted in Turkey, we discovered that vaccine acceptability was not related to the average age of children in our study; however, a Chinese study found that vaccine acceptability was lower for young children of parents (23, 29). The difference in Turkey may be due to the fact that education has continued online since the beginning of the pandemic in our country.

In our study, 11% of parents had previously refused vaccination, which is consistent with the literature and willingness to allow vaccination was found to be related to current vaccination program compliance (21, 30-32). Vaccine rejection has been observed in Turkey for the past ten years and is gradually increasing (10). In order to solve this problem, it is necessary to thoroughly address the issue of vaccine hesitancy.

Similar to previous reports in our study, participants who received vaccine information from TV/radio/newspaper wanted their child to be vaccinated with COVID-19 at a significantly higher rate than those who did not (33). Understanding the sources of information on COVID-19 vaccines that people trust the most is critical to the success of any future national immunization campaign, as these sources of information can shape people's acceptance or rejection of COVID-19 vaccines (34). According to a study conducted in France, those who received vaccine information from doctors wanted their children to be vaccinated with COVID-19 at a higher rate (35). These findings indicate that doctors, as the most trustworthy source of vaccination information, are in a unique position to combat parental vaccination hesitancy.

In our study, participants with a family history of COVID-19 death desired to have their children vaccinated at a higher rate. Unlike our study, a study discovered no significant difference (31). The reason for this could be an increase in the number of deaths caused by virus mutation between the two studies. In our study, those who do not plan to have their child vaccinated had significantly lower total COVID-19 Phobia Scale and sub-dimensions than those who planned to have their child vaccinated. These findings support previous findings that COVID-19 and its effects are significantly positively correlated with vaccine acceptance (23, 32). It should not be assumed that the positive correlation between vaccine acceptance and COVID-19-related anxiety and health fears would be beneficial in raising these fears in the general population, thereby increasing vaccine acceptance. An exaggerated fear of the pandemic is a risk factor for serious mental health problems caused by the pandemic, and it can lead to a failure to take proper and harmonious preventive measures (36). As a result, our findings emphasize the importance of improving risk communication strategies and dealing more effectively with various fears in the context of a pandemic.

When coronavirus phobia and anxiety levels were examined, it was discovered that all sub-dimensions and total scores of the COVID-19 Phobia Scale were significantly lower for people who believed the vaccine would not be protective. This finding suggests that a large number of people underestimate this disease.

The limitations of our study are that it was single-centered, conducted in a hospital setting, and face-to-face, based on the parents' own statements and the person who administered the questionnaire was a 'Doctor.' A larger sample size for future studies will result in a more accurate analysis.

CONCLUSION

While the majority of parents are willing to vaccinate themselves with the COVID-19 vaccine, the majority are hesitant to vaccinate their children, owing to concerns about vaccine side effects. In the future, administering the COVID-19 vaccine to the parents' children and fighting the pandemic will require identifying parents who are incompatible with the national vaccination program and who refuse vaccination, as well as providing accurate and effective information using media tools and health professionals. Understanding the attitudes and perspectives of parents toward COVID-19 vaccines in our study is important in terms of shedding light on the COVID-19 vaccine application and the difficulties that may be encountered in children in the future.

ETHICAL DECLARATIONS

Ethics Committee Approval: The study was carried out with the permission of University of Health and Sciences Ankara Keçiören Training and Research Hospital Clinical Research Ethics Committee (Date: 23.03.2021, Decision No: 2012-KAEK-15/2281).

Informed Consent: Because the study was designed retrospectively, no written informed consent form was obtained from patients.

Referee Evaluation Process: Externally peer-reviewed.

Conflict of Interest Statement: The authors have no conflicts of interest to declare.

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